

towards the equator act in a precisely contrary way. They apparently compress the planet where they come up to the limb, and thus the distorted figure is originated. I tried to get rid of this by very careful focussing, and thought that in transient intervals of superb definition the true spheroidal form of the planet would come out; but this was not the case. The singularity of figure was constantly maintained; so as, in fact, to form one of the most prominent features in the telescopic aspect of the planet; though it was not always equally decided, for at the end of October and on the first few nights of November it was not nearly so conspicuous as during some of the earlier observations.

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*Observations of the Great Southern Comet I (1880) made at Castle-maine, Victoria. By William Bone, Esq., M.D. (Communicated by the Secretaries.)*

I take the liberty of forwarding a memorandum of my discovery of the Comet of February last, together with my measurements.

I gave Mr. R. A. Proctor a rough memorandum of the same when here recently; but since then I have taken a fresh series of observations for ascertaining truthfully my *micrometer values*, which has altered the interpretation of the observations in declination.

For the care and accuracy of the actual measures I can now with confidence vouch, having waited until the stars came round again, and verified every position. I offer them as an amateur's effort.

1880. Feb. 2. Discovered.—At 7<sup>h</sup> 30<sup>m</sup> on the evening of Feb. 2 last, on going to my Observatory (in company with the Rev. E. Crawford, Church of England priest of this town), I noticed a peculiar band of light near the position of the Sun, which had recently set. At first I thought it was a shoot of light from one of the foundry furnaces, but its stability soon convinced me it could only be the tail of a Comet. As the light of day waned, this was quite apparent. The nucleus was below the horizon, and must have been very close to the Sun. The tail extended obliquely upwards for about 35°, near  $\beta$  *Gruis* and towards *Nebula Minor*. A careful watch was kept from this time. I then telegraphed to Mr. Ellery at the Melbourne Observatory, and sent daily reports as long as the Comet was in view; but he was not fortunate enough to see the nucleus for several days after I had measured its position. There was no sign of the Comet before sunrise on the following morning. My little Observatory was besieged.

Feb. 3.—The Comet's nucleus was still below the horizon.

The tail was a little S. of S.W., and had perceptibly travelled East and North. It was not so bright as on the previous evening, and from that circumstance and its receding from the Sun, I surmised it had passed its perihelion point.

Feb 4. Nucleus first seen.—On this evening the sky was partially obscured by a few loose cumulo-strati. At 8<sup>h</sup> 45<sup>m</sup> G. M. T. they cleared off, and I had about ten minutes' distinct view of the nucleus. It was near the horizon, and an intervening building soon destroyed my view. During the short view I had I could clearly see a "vacuole" and the reflected (to use an anatomical term) envelopes, similar to the drawings of Donati's Comet.

Feb. 5.—The approximate positions shown by the Circles of the Equatoreal (Z. Gaunt, Melbourne, with 4 $\frac{3}{4}$ -inch Wray object-glass) were—

R. A.	<sup>h</sup> 22	<sup>m</sup> 28	<sup>s</sup> 0,	Decl. S.	<sup>°</sup> 33	<sup>'</sup> 35	<sup>"</sup> 0,
Time	<sup>h</sup> 7	<sup>m</sup> 30	<sup>s</sup> 0.				

Fearing to lose my view speedily, I had arranged an Altazimuth on the top of a hill near, 200 feet above my level, and the position of the Comet's nucleus at 8<sup>h</sup> 58<sup>m</sup> was *exactly four degrees* in azimuth south of *Fomalhaut* and between 1820 and 1816 *La Caille Piscis Australis*, having the same *Right Ascension exactly* as 1820.

Feb. 6.—The nucleus was again seen, but when found was too low down for the Equatoreal.

Feb. 7 and 8.—Sky overcast. No observations.

Feb. 9.—Clear. Micrometric observations were obtained from  $\mu$  *Sculptoris*, the Circles giving Comet's approximate place—

R. A.	<sup>h</sup> 23	<sup>m</sup> 37	<sup>s</sup> 11,	Decl. S.	<sup>°</sup> 33	<sup>'</sup> 30	<sup>"</sup> 0,
Mean of Times of Measurement	<sup>h</sup> 9	<sup>m</sup> 2	<sup>s</sup> 30	G. M. T.			
Difference in R. A. :	} 0 1 35.272,						
Star preceding							
Difference in Declination :	} 0 6 20.625.						
Comet south of Star							

The nucleus was fainter and smaller, and the Comet was evidently receding rapidly. Great care had to be taken in illuminating the webs, as it was so faint. The measurements given are, however, reliable, the greatest possible care having been taken. The micrometer was a Ramsden's, by Ross, of London.

Dec. 1880. *observed at Castlemaine, Victoria.*

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Feb. 10.—The nucleus was again seen, but my professional engagements had detained me, and before any measurements could be taken it became overcast. The approximate position given by the Circles was\*—

$$\text{R. A. } \begin{matrix} \text{h} & \text{m} & \text{s} \\ 23 & 55 & 27, \end{matrix} \text{ Dec. S. } \begin{matrix} 33^{\circ} & 28' & 0'' \end{matrix}$$

Feb. 11, 12, 13.—Overcast.

Feb. 14.—Good measurements were obtained from  $\sigma$  *Sculptoris*.

The approximate place of the Comet by the Circles was—

$$\text{R. A. } \begin{matrix} \text{h} & \text{m} & \text{s} \\ 1 & 2 & 58, \end{matrix} \text{ Dec. S. } \begin{matrix} 32^{\circ} & 3' & 0'' \end{matrix}$$

The differences by means of *seven* measurements at a mean of time 9<sup>h</sup> 31 15<sup>s</sup> Greenwich mean time were—

$$\begin{array}{lcl} \text{Difference in R. A.:} & \left. \vphantom{\begin{array}{l} \text{Difference in R. A.:} \\ \text{Star preceding} \end{array}} \right\} & \begin{matrix} \text{h} & \text{m} & \text{s} \\ +0 & 5 & 1.16, \end{matrix} \\ \text{Difference in Declination:} & \left. \vphantom{\begin{array}{l} \text{Difference in Declination:} \\ \text{Comet south of Star} \end{array}} \right\} & \begin{matrix} +0^{\circ} & 6' & 35''.85. \end{matrix} \\ \text{Star preceding} & & \\ \text{Comet south of Star} & & \end{array}$$

The night was beautifully clear, and these were capital observations. I applied the spectroscope, but its light was too faint with my aperture to get any reliable reaction.

Feb. 15.—Splendid measurements were obtained from two stars nearly same R. A. and about 14' apart, the Comet showing between them. [Sketch annexed.] Approximate position of Comet was—

$$\text{R. A. } \begin{matrix} \text{h} & \text{m} & \text{s} \\ 1 & 12 & 14.35, \end{matrix} \text{ Decl. S. } \begin{matrix} 31^{\circ} & 33' & 0'' \end{matrix}$$

The southernmost star I will call A, the northern B. They were about 5 and 6 mag., as far as I could estimate, but having no larger star catalogue than that contained in "Loomis," I am not able to identify them. At first I thought they were  $\tau$  and  $\pi$  *Sculptoris*, but the distance between them is not sufficient. I have C. Dieu and Flammarion's maps, and there are marked stars corresponding to these in R. A. but in Decl. S.  $34^{\circ} 0' 0''$ . I know my telescope is within a minute, and is so correct that I can find stars in that region easily from catalogue places without altering the setting of the verniers. There is no error in the sixth correction.

\* On this day I fancied the Comet was affected by the attraction of *Jupiter*.

Means of Times =		<sup>h</sup> <sup>m</sup> <sup>s</sup> 9 20 11 G. M. T,
Difference in R. A.	{ from A,	— 0 2 5'2,
Comet preceding,	{ from B,	— 0 2 17'6,
Difference in Decl.	{ from A, Star north,	0 6 35'719,
	{ from B, Star south,	0 7 26'25.

These were also beautiful observations.

Feb. 16.—Again I had beautiful measurements. [Sketch annexed.] There is a group similar to this in Flammarion's map, but in different Declination to my reading, but there is also another group marked in correct position very similar. The above is a faithful sketch of the appearance at 10<sup>h</sup> 16<sup>m</sup> 19<sup>s</sup> Greenwich mean time. The approximate position of the Comet by the Circles was—

R. A.		<sup>h</sup> <sup>m</sup> <sup>s</sup> 1 23 55,
Dec. S.		30 57 0,
Difference in R. A.:	} +	<sup>h</sup> <sup>m</sup> <sup>s</sup>
Star preceding,		0 3 8'264
Difference in Declination:	} +	0 5 5'288.
Comet south of Star,		

Feb. 17.—The nucleus was visible after a long search, but was too faint to bear illumination, so that measurements could not be obtained. The approximate position by the Circles was—

R. A.	<sup>h</sup> <sup>m</sup> <sup>s</sup> 1 41 22'5	Decl. S.	30 2' 0"
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After this "he went his way and I saw him no more," and I much fear me I never shall again.

Latitude S. 37° 4' 10''·97. Longitude E. 9<sup>h</sup> 36<sup>m</sup> 56<sup>s</sup>.

*Castlemaine, Victoria, Australia,*  
1880, October 10.